

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

In re patent application of:

Uri L. ZILBERMAN

Conf. No.: 5141

Application No.: 10/685,803

Art Unit: 3732

Filed: October 16, 2003

Examiner: Matthew M. Nelson

For: **DENTAL CROWNS**

***REPLY BRIEF***

This is an appeal to the Board of Patent Appeals and Interferences from the Office Action mailed December 3, 2009, rejecting claims 1 – 10. Appellant filed a Notice of Appeal and Pre-Appeal Brief Request for Review on June 3, 2010. A Notice of Panel Decision was mailed on June 21, 2010. An Appeal Brief was filed on August 30, 2010. An Examiner's Answer was mailed November 23, 2010. This Reply Brief in response to the Examiner's Answer is timely submitted on or before the due date of January 23, 2011.

***TABLE OF CONTENTS***

<u>Item</u>	<u>Page Number</u>
(i) Status of claims	3
(ii) Response to Advisory Action	4
(iii) Grounds of rejection to be reviewed on appeal	5
(iv) Arguments	6
(v) Conclusion	10
(vi) Appendix of Claims on Appeal	11

***STATUS OF CLAIMS***

A. Total Number of Claims in Application

There are 10 claims pending in the application.

B. Current Status of Claims

1. Claims pending: Claims 1 – 10
2. Claims withdrawn from consideration but not canceled: None
3. Claims canceled: Claim 11
4. Claims allowed: None
5. Claims rejected: Claims 1 – 10
6. Claims objected to: None

C. Claims on Appeal

The claims on appeal are claims 1 – 10. A clean copy of the claims on appeal is reproduced in the attached **Appendix of Claims on Appeal**.

***RESPONSE TO ADVISORY ACTION***

Appellant thanks the Examiner for streamlining prosecution by including in his Examiner's Answer remarks regarding the Advisory Action mailed November 9, 2011. Although not an issue raised by Appellant in the Appeal Brief or the arguments that follow in this Reply, Appellant submits the following in response to the remarks on page 3 of the Examiner's Answer.

Specifically, the Examiner states that the amendment to the specification submitted by Appellant on September 3, 2010 will not be entered because the incorporation by reference statement is potential new matter. Appellant respectfully disagrees. In the initial filing transmittal submitted October 16, 2003, Appellant's representatives included a request to amend the specification on page 3 of 4 of the document labeled "Filing Form for Continuation-In-Part of International Patent Application." The request asks that the specification be amended by inserting the following before the first line of the first sentence:

This is a Continuation-In-Part of International Patent Application PCT/IL02/00310 with an international filing date of 16 April 2002 which claims priority to Israel Application No. 142657 filed 17 April 2001 and US Application No. 09/903,096 filed 11 July 2001, **the entire contents of which are hereby incorporated by reference in their entirety** (emphasis added).

Accordingly, Appellant submits that since these references were incorporated by reference in their entirety in the initial filing, the incorporation by reference statement in the amendment to the specification submitted on September 3, 2010 does not add new matter and should be entered.

***GROUND OF REJECTION TO BE REVIEWED ON APPEAL***

First, whether claims 1 – 9 are unpatentable under 35 U.S.C. 103(a) over U.S. Patent No. 5,487,663 (“Wilson”) in view of U.S. Patent No. 3,647,498 (“Dougherty”).

Second, whether claim 10 is unpatentable under 35 U.S.C. 103(a) over Wilson and Dougherty further in view of U.S. Patent No. 6,186,790 (“Karmaker”).

## **ARGUMENTS**

**1. The Office Action improperly rejects claims 1 – 9 as unpatentable under 35 U.S.C. 103(a) over Wilson in view of Dougherty.**

Appellant maintains the remarks of the Appeal Brief submitted August 30, 2010, and respectfully traverses the assertions of the Examiner's Answer mailed November 23, 2010. Appellant submits that the rejection of claims 1 – 9 is improper and should be reversed for at least the following additional reasons.

**a. Wilson expressly teaches away from “an undercut defining an inwardly directed inner surface.”**

Appellant respectfully traverses the assertion on page 6 of the Examiner's Answer that Wilson “cannot be said to teach away from an undercut.” As the Examiner admits on page 4 of his Answer, Wilson fails to show an undercut defining an inwardly directed inner surface.” This makes sense, since Wilson discloses at col. 2, lines 48 – 56, for example, that at the time “it [was] common practice to prepare a cervical margin on the damaged tooth, and by forming the crown with a negative draft above the crown margin or height of contour on the cervical margin of the tooth preparation so that it can be snapped in place or engaged over the crown margin or cervical height of contour. Use of this kind of construction, however, tends to make the resultant resin restoration more bulky than is necessary, **and severely hampers the professional's ability to work on adjacent teeth.**” *Id.* (emphasis added). Thus, Wilson expressly discloses that an undercut is an undesirable feature in a crown.

Wilson also discloses that “[i]n stark contrast to existing crown configurations, it is an important feature of the present invention that the side wall, or walls, 20 **are essentially straight, as contrasted to existing art wherein the sidewalls have a distinct negative draft**. When fitted, the **side walls remain, for all intents and purposes, parallel**.” Wilson col. 3, lines 61 – 66 (emphasis added). Thus, not only does Wilson teach that an undercut is undesirable, the reference expressly discloses that the embodiments taught lack the negative draft recited in the claims.

Dougherty, the remaining reference used to support the rejection of claim 1, fails to make up for the deficiencies of Wilson noted above. Dougherty is cited as allegedly teaching other features of claim 1, but not for teaching or suggesting an “undercut defining an inwardly directed inner surface.” Accordingly, Appellant respectfully submits that Wilson, alone or combined with Dougherty, fails to prompt a person of ordinary skill in the relevant field to combine the cited prior art in the manner claimed. For at least these reasons, Appellant respectfully submits that claim 1 is allowable over Wilson in view of Dougherty, and the rejection under 35 U.S.C. § 103(a) is improper and should be reversed.

***c. Claims 2 – 9 are also allowable at least for their dependence from independent claim 1.***

Appellant further submits that claims 2 – 9 are also allowable at least because they depend from independent claim 1. Accordingly, Appellant submits that the rejection of claims 2 – 9 under 35 U.S.C. § 103(a) should also be reversed.

**2. *The Office Action improperly rejects claim 10 as unpatentable under 35 U.S.C. 103(a) over Wilson and Dougherty further in view of Karmaker.***

Appellant maintains the remarks of the Appeal Brief submitted August 30, 2010, and respectfully traverses the assertions of the Examiner's Answer mailed November 23, 2010. Appellant submits that the rejection of claim 10 is improper and should be reversed for at least the following additional reasons.

**a. *Wilson expressly teaches away from "an undercut defining an inwardly directed inner surface."***

Page 5 of the Examiner's Answer states that claim 10 is rejected for the reasons discussed for the rejection of claims 1 – 9, further in view of Karmaker. As discussed in section one, Wilson, alone or combined with Dougherty, fails to teach or suggest "an undercut defining an inwardly directed inner surface" which is also recited in claim 10. Karmaker, the only additional reference used to reject claim 10, fails to make up for the deficiencies of Wilson and Dougherty. Karmaker is cited as allegedly teaching additional features of claim 10, but not for teaching or suggesting the features discussed in section one above.

Accordingly, Appellant respectfully submits that Wilson and Dougherty, alone or combined with Karmaker, fail to prompt a person of ordinary skill in the relevant field to combine the cited prior art in the manner claimed. For at least these reasons, Appellant respectfully submits that claim 10 is allowable over Wilson in view of Dougherty and Karmaker, and the rejection under 35 U.S.C. § 103(a) is improper and should be reversed.



***b. The Office Action improperly combines Karmaker with Wilson and Dougherty.***

Notwithstanding and in addition to the above, Appellant submits that it is improper to combine Karmaker with Wilson and Dougherty. As acknowledged on page 3 of the Office Action, Wilson and Dougherty “fail to show the polymer material as claimed.” To make up for this deficiency, the Examiner states in his Answer that “Karmaker specifically states that material is selected from those known in the art of dental materials and the list of materials provided in [Karmaker] col. 3, lines 35 – 42 for instance. Karmaker is therefore stating that one thermoplastic polymer material may be selected.” Examiner’s Answer at 7.

Appellant respectfully disagrees. Karmaker col. 3, lines 35 – 42 describes a “polymeric **matrix** element of the composite.” *Id.* (emphasis added). As disclosed in Karmaker col. 3, lines 60 – 65, this polymer matrix “typically includes polymerization initiators, polymerization accelerators, ultraviolet light absorbers, anti-oxidants, and other additives well known in the art.” Claim 10, however, recites in part a “dental crown **consisting of** a layer of acetal homopolymer resin” as recited in claim 10 (emphasis added). Thus, the additional elements of the Karmaker matrix are excluded by the “consisting of” language of claim 10. Accordingly Karmaker, alone or combined with Wilson and Dougherty, fails at least to teach or suggest each and every element of the claimed subject matter. For at least these additional reasons, the rejection of claim 10 is improper and should be reversed.

**CONCLUSION**

For the foregoing reasons, Appellant respectfully submits that the Examiner's rejection of the presently pending claims was erroneous. Accordingly, Appellant respectfully requests reversal of the Examiner's decision.

The Commissioner is authorized to charge Deposit Account No. 14-0112 for any additional charges in connection with this appeal.

The Examiner is welcomed to contact the undersigned attorney if such contact would be helpful in the further prosecution of this case.

Respectfully submitted,  
**THE NATH LAW GROUP**

Date: January 21, 2011

/Susanne M. Hopkins/

**THE NATH LAW GROUP**  
112 South West Street  
Alexandria, VA 22314-2891  
Tel: 703-548-6284  
Fax: 703-683-8396

---

Susanne M. Hopkins  
Registration No. 33,247  
William L. Klima  
Registration No. 32,422  
Robert T. Burns  
Registration No. 60,545  
**Customer No. 20529**

***Appendix of Claims on Appeal***

1. (Previously presented) A dental crown configured to be readily mountable in a patient's mouth as part of a treatment of primary teeth and permanent molars, the dental crown having a natural appearance and color of a vital tooth and consisting of:

a thermoplastic material layer configured to define a tooth shaped top surface; and

depending flexible side surfaces extending continuously from said tooth shaped top surface towards a bottom portion of the dental crown, said thermoplastic material layer being configured to enable dimensional stability and sufficient resilience of the crown, and

a bottom portion of at least one of said depending flexible continuous side surfaces comprising an undercut defining an inwardly directed inner surface of said bottom portion, the resilience of the flexible depending side surfaces and the undercut made in the bottom portion of at least one of the flexible side surfaces, enabling the dental crown to be directly mounted on a primary tooth or permanent molar.

2. (Previously presented) A dental crown according to claim 1, wherein said thermoplastic material comprises a polymer selected from polyacetal, polyacrylate, polymethylmethacrylate (PMMA), polyamide, polyaryletherketone (PAEK),

polyetherketone (PEK), polyetheretherketone (PEEK), polyetherimide (PEI),  
polyethersulfone (PES), polysulfone (PSU), and mixtures thereof.

3. (Previously presented) A dental crown according to claim 2, wherein said polymer is a homo- or co-polymer of acetal resin, polyetheretherketone (PEEK) or polymethylmethacrylate (PMMA).

4. (Previously presented) A dental crown according to claim 1, wherein said thermoplastic material comprises at least one of the following: fibers, fillers, pigments and reinforcements.

5. (Original) A dental crown according to claim 1, formed by injection molding.

6. (Previously presented) A dental crown according to claim 5, produced by a mass production injection molding method, said mass production injection molding method comprising:

providing a multi-element mold; and

employing the multi-element mold to injection mold a dental crown from a thermoplastic polymer material.

7. (Original) A dental crown according to claim 6, wherein said multi-element mold includes an ejector, which is being operated to eject the molded crown following opening the multi-element mold.

8. (Original) A dental crown according to claim 1, formed by compression molding.

9. (Original) A dental crown according to claim 1, formed by machining.

10. (Previously presented) A permanent dental crown configured to be readily mounted in a patient's mouth as part of treatment of primary teeth and permanent molars,

the dental crown consisting of a layer of acetal homopolymer resin configured to define a tooth shaped top surface and depending flexible side surfaces extending continuously from the top surface towards a bottom portion of the dental crown,

said layer of the acetal homopolymer resin being configured to provide dimensional stability and desired resilience of the crown, and

at least one of said depending flexible continuous side surfaces being formed within the bottom portion of the crown with an undercut defining an inwardly directed inner surface of said bottom portion, the resilience of the flexible side surfaces and the undercut enabling the dental crown to be readily mountable on a primary tooth or permanent molar.

11. (Canceled).